

Grid

Grid The Grid system is a comprehensive CSS-based layout framework that provides responsive, mobile-first grid classes for building flexible and adaptive layouts. Based on Bootstrap's flexbox grid system, it includes containers, rows, columns, and extensive flexbox utilities with breakpoint-specific behavior. How to use ■ The Grid system is implemented as CSS classes that can be applied directly to HTML elements. No JavaScript or Angular components are required. <div class="container"><div class="row"><div class="col-md-6">Column 1</div><div class="col-md-6">Column 2</div></div></div> Basic Grid ■ Simple grid layout with equal-width columns. Responsive Grid ■ Grid layout that adapts to different screen sizes using breakpoint-specific classes. Flexbox Utilities ■ Advanced flexbox utilities for controlling layout direction, alignment, and spacing. Alignment ■ Flexbox alignment utilities for controlling how items are positioned within containers. Ordering ■ CSS order utilities for controlling the visual order of flex items. Features ■ Container System ■ Fixed Container : .container with responsive max-widths Fluid Container : .container-fluid for full-width layouts Responsive Breakpoints : Automatic width adjustments at different screen sizes Consistent Padding : 15px horizontal padding on all containers Row System ■ Flexbox Rows : .row creates flex containers with wrap enabled Negative Margins : Automatic gutter compensation with -15px margins No Gutters : .no-gutters class removes spacing between columns Responsive Behavior : Consistent behavior across all breakpoints Column System ■ 12-Column Grid : Standard 12-column layout system Responsive Classes : Breakpoint-specific column classes (sm, md, lg, xl) Auto Columns : .col and .col-auto for flexible sizing Fixed Widths : Classes from .col-1 to .col-12 for precise control Breakpoint System ■ Extra Small (xs) : Default, no prefix (0px and up) Small (sm) : 576px and up Medium (md) : 768px and up Large (lg) : 992px and up Extra Large (xl) : 1200px and up Flexbox Utilities ■ Direction : Row, column, and reverse variants Wrap : Wrap, nowrap, and wrap-reverse options Justify Content : Start, end, center, between, around Align Items : Start, end, center, baseline, stretch Align Content : Start, end, center, between, around, stretch Align Self : Auto, start, end, center, baseline, stretch Positioning Utilities ■ Offsets : .offset-* classes for column positioning Push/Pull : .push-* and .pull-* for reordering Order : .order-* classes for flex item ordering Responsive Variants : All utilities available at each breakpoint CSS Classes ■ Container Classes ■ Class Description .container Fixed-width container with responsive max-widths .container-fluid Full-width container spanning the entire viewport Row Classes ■ Class Description .row Flexbox row container with wrap enabled .no-gutters Removes gutters from row and its columns Column Classes ■ Basic Columns ■ Class Width Description .col Auto Equal-width column that grows to fill space .col-auto Auto Column sized to content .col-1 8.333% 1/12 width column .col-2 16.667% 2/12 width column .col-3 25% 3/12 width column .col-4 33.333% 4/12 width column .col-5 41.667% 5/12 width column .col-6 50% 6/12 width column .col-7 58.333% 7/12 width column .col-8 66.667% 8/12 width column .col-9 75% 9/12 width column .col-10 83.333% 10/12 width column .col-11 91.667% 11/12 width column .col-12 100%

Full-width column Responsive Columns ■ Class Breakpoint Description .col-sm-* ≥576px Small screen columns .col-md-* ≥768px Medium screen columns .col-lg-* ≥992px Large screen columns .col-xl-* ≥1200px Extra large screen columns Flexbox Direction Classes ■ Class Description .flex-row Horizontal direction (default) .flex-column Vertical direction .flex-row-reverse Horizontal direction, reversed .flex-column-reverse Vertical direction, reversed Flexbox Wrap Classes ■ Class Description .flex-wrap Allow items to wrap to next line .flex-nowrap Prevent wrapping (default) .flex-wrap-reverse Wrap items in reverse order Justify Content Classes ■ Class Description .justify-content-start Align items to start .justify-content-end Align items to end .justify-content-center Center items .justify-content-between Space items evenly .justify-content-around Space items with equal margins Align Items Classes ■ Class Description .align-items-start Align items to start .align-items-end Align items to end .align-items-center Center items .align-items-baseline Align items to baseline .align-items-stretch Stretch items (default) Align Content Classes ■ Class Description .align-content-start Align content to start .align-content-end Align content to end .align-content-center Center content .align-content-between Space content evenly .align-content-around Space content with equal margins .align-content-stretch Stretch content (default) Align Self Classes ■ Class Description .align-self-auto Auto alignment (default) .align-self-start Align self to start .align-self-end Align self to end .align-self-center Center self .align-self-baseline Align self to baseline .align-self-stretch Stretch self Order Classes ■ Class Description .order-first Order: -1 .order-last Order: 13 .order-1 Order: 1 .order-2 Order: 2 .order-3 Order: 3 Offset Classes ■ Class Margin Left Description .offset-1 8.333% Offset by 1 column .offset-2 16.667% Offset by 2 columns .offset-3 25% Offset by 3 columns .offset-4 33.333% Offset by 4 columns .offset-5 41.667% Offset by 5 columns .offset-6 50% Offset by 6 columns .offset-7 58.333% Offset by 7 columns .offset-8 66.667% Offset by 8 columns .offset-9 75% Offset by 9 columns .offset-10 83.333% Offset by 10 columns .offset-11 91.667% Offset by 11 columns Push/Pull Classes ■ Class Description .push-* Push columns to the right .pull-* Pull columns to the left CSS Custom Properties ■ The Grid system uses standard CSS properties and doesn't rely on CSS custom properties. However, it's designed to work seamlessly with CSS custom properties for theming: Property Description Default --grid-gutter-width Width of grid gutters 30px --grid-columns Number of grid columns 12 --container-max-widths Container max-widths 540px, 720px, 960px, 1140px --grid-breakpoints Breakpoint values 576px, 768px, 992px, 1200px Best Practices ■ Layout Structure ■ Container First : Always start with a container (.container or .container-fluid) Row Wrapper : Wrap columns in a .row element Column Classes : Use appropriate column classes for desired widths Responsive Design : Use breakpoint-specific classes for mobile-first design Responsive Design ■ Mobile First : Design for mobile devices first, then enhance for larger screens Breakpoint Strategy : Use consistent breakpoints across your application Progressive Enhancement : Start with basic layout, add complexity for larger screens Content Priority : Ensure important content is visible on all screen sizes Performance ■ CSS Efficiency : Grid classes are optimized for performance Minimal Nesting : Avoid deeply nested grid structures when possible Semantic HTML : Use semantic HTML elements with grid classes Browser Support : Grid system works in all modern browsers Accessibility ■ Logical Order :

Ensure content flows logically regardless of visual order Screen Readers : Grid layout doesn't affect screen reader navigation Keyboard Navigation : Maintain logical tab order Focus Management : Ensure focus indicators are visible Content Organization ■ Consistent Spacing : Use consistent gutters and spacing Content Hierarchy : Use grid to establish clear visual hierarchy Flexible Content : Design content to work across different column widths Responsive Images : Ensure images scale appropriately within grid columns Accessibility Guidelines ■ Semantic Structure ■ HTML Semantics : Use semantic HTML elements with grid classes Document Outline : Ensure proper heading hierarchy within grid layouts Landmark Roles : Use appropriate ARIA landmarks for major layout sections Content Flow : Maintain logical content flow regardless of visual layout Screen Reader Support ■ Logical Order : Content should flow logically for screen readers Descriptive Labels : Use descriptive labels for interactive elements Skip Links : Provide skip links for navigation-heavy layouts Focus Indicators : Ensure focus indicators are visible and logical Keyboard Navigation ■ Tab Order : Maintain logical tab order through grid layouts Focus Management : Ensure focus moves logically through content Keyboard Shortcuts : Provide keyboard shortcuts for complex layouts Escape Mechanisms : Allow users to escape from complex layouts Visual Design ■ High Contrast : Ensure sufficient contrast ratios in grid layouts Color Independence : Don't rely solely on color for information Text Scaling : Support for text scaling and zoom Motion Sensitivity : Provide alternatives for users sensitive to motion Responsive Behavior ■ Mobile Adaptations ■ The Grid system automatically adapts to mobile screens: Stacked Layout : Columns stack vertically on small screens Full Width : Single columns take full width on mobile Touch Optimization : Layouts are optimized for touch interaction Performance : Optimized performance for mobile devices Breakpoint Behavior ■ Extra Small (0px+) : Single column layout, stacked content Small (576px+) : Multi-column layouts begin to appear Medium (768px+) : Tablet-optimized layouts Large (992px+) : Desktop layouts with full feature set Extra Large (1200px+) : Large desktop and wide screen layouts Content Considerations ■ Flexible Images : Images scale appropriately within grid columns Text Readability : Text remains readable at all column widths Touch Targets : Interactive elements maintain appropriate touch target sizes Loading Performance : Layouts load efficiently on all devices

```
<div class="grid-basic-demo">
  <h3>Basic Grid Layout</h3>

  <div class="demo-section">
    <h4>Equal Width Columns</h4>
    <p>
      Basic grid with equal-width columns using the <code>.col</code> class.
    </p>

    <div class="container">
      <div class="row">
        <div class="col">
          <div class="grid-item">
            <h5>Column 1</h5>
            <p>This column automatically sizes to fill available space.</p>
          </div>
        </div>
        <div class="col">
          <div class="grid-item">
            <h5>Column 2</h5>
            <p>This column also automatically sizes to fill available space.</p>
          </div>
        </div>
        <div class="col">
          <div class="grid-item">
            <h5>Column 3</h5>
            <p>All columns in this row have equal width.</p>
          </div>
        </div>
      </div>
    </div>
  </div>

  <div class="demo-section">
    <h4>Fixed Width Columns</h4>
    <p>Grid with specific column widths using numbered classes.</p>

    <div class="container">
      <div class="row">
        <div class="col-8">
          <div class="grid-item primary">
            <h5>Main Content (8/12)</h5>
            <p>This column takes up 8 out of 12 grid columns (66.67% width).</p>
          </div>
        </div>
        <div class="col-4">
          <div class="grid-item secondary">
            <h5>Sidebar (4/12)</h5>
            <p>This column takes up 4 out of 12 grid columns (33.33% width).</p>
          </div>
        </div>
      </div>
    </div>
  </div>

  <div class="demo-section">
```

<h4>Mixed Column Types</h4>

<p>Combining fixed-width and auto-width columns.</p>

```
<div class="container">
  <div class="row">
    <div class="col-6">
      <div class="grid-item">
        <h5>Fixed Width (6/12)</h5>
        <p>This column has a fixed width of 50%.</p>
      </div>
    </div>
    <div class="col">
      <div class="grid-item">
        <h5>Auto Width</h5>
        <p>This column automatically sizes to fill remaining space.</p>
      </div>
    </div>
    <div class="col-auto">
      <div class="grid-item compact">
        <h5>Auto Size</h5>
        <p>Fits content.</p>
      </div>
    </div>
  </div>
</div>

<div class="demo-section">
  <h4>Container Types</h4>
  <p>Different container types for different layout needs.</p>

  <div class="container">
    <div class="row">
      <div class="col-12">
        <div class="grid-item">
          <h5>Fixed Container</h5>
          <p>
            This uses <code>.container</code> with responsive max-widths and
            centered content.
          </p>
        </div>
      </div>
    </div>
  </div>

  <div class="container-fluid">
    <div class="row">
      <div class="col-12">
        <div class="grid-item fluid">
          <h5>Fluid Container</h5>
          <p>
            This uses <code>.container-fluid</code> for full-width layout
            spanning the entire viewport.
          </p>
        </div>
      </div>
    </div>
  </div>
```

```

    </div>
  </div>
</div>

<div class="demo-section">
  <h4>No Gutters</h4>
  <p>Grid without gutters using the <code>.no-gutters</code> class.</p>

  <div class="container">
    <div class="row no-gutters">
      <div class="col-4">
        <div class="grid-item no-gutter">
          <h5>No Gutter</h5>
          <p>This column has no spacing between it and adjacent columns.</p>
        </div>
      </div>
      <div class="col-4">
        <div class="grid-item no-gutter">
          <h5>No Gutter</h5>
          <p>Adjacent columns touch each other with no gap.</p>
        </div>
      </div>
      <div class="col-4">
        <div class="grid-item no-gutter">
          <h5>No Gutter</h5>
          <p>Perfect for seamless layouts and full-width designs.</p>
        </div>
      </div>
    </div>
  </div>
</div>

<div class="demo-info">
  <h4>Basic Grid Features</h4>
  <ul>
    <li>
      <strong>Container System:</strong> Fixed-width and fluid containers
    </li>
    <li>
      <strong>Row Wrapper:</strong> Flexbox rows with automatic gutter management
    </li>
    <li>
      <strong>Column Classes:</strong> Equal-width, fixed-width, and auto-width options
    </li>
    <li>
      <strong>No Gutters:</strong> Option to remove spacing between columns
    </li>
    <li>
      <strong>Responsive Foundation:</strong> Mobile-first approach with responsive breakpoints
    </li>
  </ul>
</div>
</div>

```

```
import { Component } from "@angular/core";

@Component({
  selector: "app-grid-basic",
  standalone: true,
  template: `
    <div class="grid-basic-demo">
      <h3>Basic Grid Layout</h3>

      <div class="demo-section">
        <h4>Equal Width Columns</h4>
        <p>
          Basic grid with equal-width columns using the <code>.col</code> class.
        </p>

        <div class="container">
          <div class="row">
            <div class="col">
              <div class="grid-item">
                <h5>Column 1</h5>
                <p>This column automatically sizes to fill available space.</p>
              </div>
            </div>
            <div class="col">
              <div class="grid-item">
                <h5>Column 2</h5>
                <p>
                  This column also automatically sizes to fill available space.
                </p>
              </div>
            </div>
            <div class="col">
              <div class="grid-item">
                <h5>Column 3</h5>
                <p>All columns in this row have equal width.</p>
              </div>
            </div>
          </div>
        </div>

        <div class="demo-section">
          <h4>Fixed Width Columns</h4>
          <p>Grid with specific column widths using numbered classes.</p>

          <div class="container">
            <div class="row">
              <div class="col-8">
                <div class="grid-item primary">
                  <h5>Main Content (8/12)</h5>
                  <p>
                    This column takes up 8 out of 12 grid columns (66.67% width).
                  </p>
                </div>
              </div>
            </div>
          </div>
        </div>
      </div>
    </div>
  `
})
```

```

    </div>
    <div class="col-4">
      <div class="grid-item secondary">
        <h5>Sidebar (4/12)</h5>
        <p>
          This column takes up 4 out of 12 grid columns (33.33% width).
        </p>
      </div>
    </div>
  </div>
</div>
</div>
</div>

<div class="demo-section">
  <h4>Mixed Column Types</h4>
  <p>Combining fixed-width and auto-width columns.</p>

  <div class="container">
    <div class="row">
      <div class="col-6">
        <div class="grid-item">
          <h5>Fixed Width (6/12)</h5>
          <p>This column has a fixed width of 50%.</p>
        </div>
      </div>
      <div class="col">
        <div class="grid-item">
          <h5>Auto Width</h5>
          <p>This column automatically sizes to fill remaining space.</p>
        </div>
      </div>
      <div class="col-auto">
        <div class="grid-item compact">
          <h5>Auto Size</h5>
          <p>Fits content.</p>
        </div>
      </div>
    </div>
  </div>
</div>

<div class="demo-section">
  <h4>Container Types</h4>
  <p>Different container types for different layout needs.</p>

  <div class="container">
    <div class="row">
      <div class="col-12">
        <div class="grid-item">
          <h5>Fixed Container</h5>
          <p>
            This uses <code>.container</code> with responsive max-widths
            and centered content.
          </p>
        </div>
      </div>
    </div>
  </div>
</div>

```



```

    </div>
</div>

<div class="container-fluid">
  <div class="row">
    <div class="col-12">
      <div class="grid-item fluid">
        <h5>Fluid Container</h5>
        <p>
          This uses <code>.container-fluid</code> for full-width layout
          spanning the entire viewport.
        </p>
      </div>
    </div>
  </div>
</div>

<div class="demo-section">
  <h4>No Gutters</h4>
  <p>Grid without gutters using the <code>.no-gutters</code> class.</p>

  <div class="container">
    <div class="row no-gutters">
      <div class="col-4">
        <div class="grid-item no-gutter">
          <h5>No Gutter</h5>
          <p>
            This column has no spacing between it and adjacent columns.
          </p>
        </div>
      </div>
      <div class="col-4">
        <div class="grid-item no-gutter">
          <h5>No Gutter</h5>
          <p>Adjacent columns touch each other with no gap.</p>
        </div>
      </div>
      <div class="col-4">
        <div class="grid-item no-gutter">
          <h5>No Gutter</h5>
          <p>Perfect for seamless layouts and full-width designs.</p>
        </div>
      </div>
    </div>
  </div>

<div class="demo-info">
  <h4>Basic Grid Features</h4>
  <ul>
    <li>
      <strong>Container System:</strong> Fixed-width and fluid containers
    </li>
    <li>
      <strong>Row Wrapper:</strong> Flexbox rows with automatic gutter
    </li>
  </ul>

```

```

        management
    </li>
    <li>
        <strong>Column Classes:</strong> Equal-width, fixed-width, and
        auto-width options
    </li>
    <li>
        <strong>No Gutters:</strong> Option to remove spacing between
        columns
    </li>
    <li>
        <strong>Responsive Foundation:</strong> Mobile-first approach with
        responsive breakpoints
    </li>
</ul>
</div>
</div>
,
styles: [
    ,
    .grid-basic-demo {
        padding: 20px;
        max-width: 1200px;
        margin: 0 auto;
    }

    .grid-basic-demo h3 {
        margin: 0 0 20px 0;
        color: #333;
        font-size: 24px;
        font-weight: 600;
    }

    .demo-section {
        margin-bottom: 40px;
        padding: 20px;
        border: 1px solid #e5e7eb;
        border-radius: 8px;
        background: #f9fafb;
    }

    .demo-section h4 {
        margin: 0 0 12px 0;
        color: #333;
        font-size: 18px;
        font-weight: 600;
    }

    .demo-section p {
        margin: 0 0 20px 0;
        color: #555;
        line-height: 1.5;
    }

    .demo-section code {
        background: #f1f3f4;

```

```
padding: 2px 6px;
border-radius: 4px;
font-family: monospace;
font-size: 14px;
}

.grid-item {
  background: #fff;
  border: 1px solid #e5e7eb;
  border-radius: 6px;
  padding: 20px;
  height: 100%;
  min-height: 120px;
  display: flex;
  flex-direction: column;
  justify-content: center;
}

.grid-item h5 {
  margin: 0 0 12px 0;
  color: #333;
  font-size: 16px;
  font-weight: 600;
}

.grid-item p {
  margin: 0;
  color: #666;
  line-height: 1.4;
}

.grid-item.primary {
  background: #e3f2fd;
  border-color: #2196f3;
}

.grid-item.secondary {
  background: #f3e5f5;
  border-color: #9c27b0;
}

.grid-item.compact {
  min-height: 80px;
  padding: 15px;
}

.grid-item.fluid {
  background: #e8f5e8;
  border-color: #4caf50;
}

.grid-item.no-gutter {
  border-radius: 0;
  border-left: none;
}
```

```

.grid-item.no-gutter:first-child {
  border-left: 1px solid #e5e7eb;
  border-top-left-radius: 6px;
  border-bottom-left-radius: 6px;
}

.grid-item.no-gutter:last-child {
  border-top-right-radius: 6px;
  border-bottom-right-radius: 6px;
}

.demo-info {
  margin-top: 40px;
  padding: 20px;
  background: #f8f9fa;
  border: 1px solid #dee2e6;
  border-radius: 8px;
}

.demo-info h4 {
  margin: 0 0 16px 0;
  color: #333;
  font-size: 18px;
  font-weight: 600;
}

.demo-info ul {
  margin: 0;
  padding-left: 20px;
  color: #555;
}

.demo-info li {
  margin-bottom: 8px;
  line-height: 1.4;
}

.demo-info strong {
  color: #333;
}
},
],
})
export class GridBasicComponent {
  constructor() {
    console.log("Grid Basic Component initialized");
  }
}

```

```

<div class="grid-responsive-demo">
  <h3>Responsive Grid Layout</h3>

  <div class="demo-section">
    <h4>Responsive Column Classes</h4>
    <p>
      Grid columns that adapt to different screen sizes using
      breakpoint-specific classes.
    </p>

    <div class="container">
      <div class="row">
        <div class="col-12 col-sm-6 col-md-4 col-lg-3">
          <div class="grid-item responsive">
            <h5>Responsive Column</h5>
            <p>
              <strong>Mobile:</strong> 12/12 (100%)<br />
              <strong>Small:</strong> 6/12 (50%)<br />
              <strong>Medium:</strong> 4/12 (33.33%)<br />
              <strong>Large:</strong> 3/12 (25%)
            </p>
          </div>
        </div>
      </div>
      <div class="col-12 col-sm-6 col-md-4 col-lg-3">
        <div class="grid-item responsive">
          <h5>Responsive Column</h5>
          <p>
            <strong>Mobile:</strong> 12/12 (100%)<br />
            <strong>Small:</strong> 6/12 (50%)<br />
            <strong>Medium:</strong> 4/12 (33.33%)<br />
            <strong>Large:</strong> 3/12 (25%)
          </p>
        </div>
      </div>
      <div class="col-12 col-sm-6 col-md-4 col-lg-3">
        <div class="grid-item responsive">
          <h5>Responsive Column</h5>
          <p>
            <strong>Mobile:</strong> 12/12 (100%)<br />
            <strong>Small:</strong> 6/12 (50%)<br />
            <strong>Medium:</strong> 4/12 (33.33%)<br />
            <strong>Large:</strong> 3/12 (25%)
          </p>
        </div>
      </div>
      <div class="col-12 col-sm-6 col-md-4 col-lg-3">
        <div class="grid-item responsive">
          <h5>Responsive Column</h5>
          <p>
            <strong>Mobile:</strong> 12/12 (100%)<br />
            <strong>Small:</strong> 6/12 (50%)<br />
            <strong>Medium:</strong> 4/12 (33.33%)<br />
            <strong>Large:</strong> 3/12 (25%)
          </p>
        </div>
      </div>
    </div>
  </div>

```

```

    </div>
  </div>
</div>

<div class="demo-section">
  <h4>Mobile-First Layout</h4>
  <p>
    Layout that starts with mobile design and progressively enhances for
    larger screens.
  </p>

  <div class="container">
    <div class="row">
      <div class="col-12 col-md-8">
        <div class="grid-item primary">
          <h5>Main Content</h5>
          <p>
            <strong>Mobile:</strong> Full width (12/12)<br />
            <strong>Medium+:</strong> 8/12 width
          </p>
          <p>
            This column takes full width on mobile devices and 8/12 width on
            medium screens and larger.
          </p>
        </div>
      </div>
      <div class="col-12 col-md-4">
        <div class="grid-item secondary">
          <h5>Sidebar</h5>
          <p>
            <strong>Mobile:</strong> Full width (12/12)<br />
            <strong>Medium+:</strong> 4/12 width
          </p>
          <p>
            This sidebar appears below the main content on mobile and beside
            it on larger screens.
          </p>
        </div>
      </div>
    </div>
  </div>
</div>

<div class="demo-section">
  <h4>Complex Responsive Layout</h4>
  <p>
    Advanced responsive layout with different column configurations at each
    breakpoint.
  </p>

  <div class="container">
    <div class="row">
      <div class="col-12 col-sm-6 col-lg-4">
        <div class="grid-item">
          <h5>Feature 1</h5>
          <p>

```

```

        <strong>Mobile:</strong> 12/12 (100%)<br />
        <strong>Small:</strong> 6/12 (50%)<br />
        <strong>Large:</strong> 4/12 (33.33%)
    </p>
</div>
</div>
<div class="col-12 col-sm-6 col-lg-4">
    <div class="grid-item">
        <h5>Feature 2</h5>
        <p>
            <strong>Mobile:</strong> 12/12 (100%)<br />
            <strong>Small:</strong> 6/12 (50%)<br />
            <strong>Large:</strong> 4/12 (33.33%)
        </p>
    </div>
</div>
<div class="col-12 col-sm-12 col-lg-4">
    <div class="grid-item">
        <h5>Feature 3</h5>
        <p>
            <strong>Mobile:</strong> 12/12 (100%)<br />
            <strong>Small:</strong> 12/12 (100%)<br />
            <strong>Large:</strong> 4/12 (33.33%)
        </p>
    </div>
</div>
</div>
</div>
</div>
</div>
<div class="demo-section">
    <h4>Responsive Navigation</h4>
    <p>Navigation layout that adapts to different screen sizes.</p>

    <div class="container">
        <div class="row align-items-center">
            <div class="col-12 col-md-3">
                <div class="grid-item nav-brand">
                    <h5>Brand Logo</h5>
                    <p>Always full width on mobile, 3/12 on medium+</p>
                </div>
            </div>
            <div class="col-12 col-md-9">
                <div class="grid-item nav-menu">
                    <h5>Navigation Menu</h5>
                    <p>Full width on mobile, 9/12 on medium+</p>
                    <div class="nav-items">
                        <span class="nav-item">Home</span>
                        <span class="nav-item">About</span>
                        <span class="nav-item">Services</span>
                        <span class="nav-item">Contact</span>
                    </div>
                </div>
            </div>
        </div>
    </div>
</div>
</div>

```

</div>

<div class="demo-section">

<h4>Responsive Form Layout</h4>

<p>

Form fields that stack on mobile and align side-by-side on larger screens.

</p>

<div class="container">

<div class="row">

<div class="col-12 col-sm-6">

<div class="grid-item form-field">

<h5>First Name</h5>

<p>Full width on mobile, 6/12 on small+</p>

</div>

</div>

<div class="col-12 col-sm-6">

<div class="grid-item form-field">

<h5>Last Name</h5>

<p>Full width on mobile, 6/12 on small+</p>

</div>

</div>

<div class="col-12">

<div class="grid-item form-field">

<h5>Email Address</h5>

<p>Always full width across all screen sizes</p>

</div>

</div>

<div class="col-12 col-md-8">

<div class="grid-item form-field">

<h5>Message</h5>

<p>Full width on mobile, 8/12 on medium+</p>

</div>

</div>

<div class="col-12 col-md-4">

<div class="grid-item form-field">

<h5>Submit</h5>

<p>Full width on mobile, 4/12 on medium+</p>

</div>

</div>

</div>

</div>

</div>

<div class="demo-info">

<h4>Responsive Grid Features</h4>

Mobile-First: Design for mobile devices first, then enhance for larger screens

Breakpoint Classes: Use <code>.col-sm-*</code>, <code>.col-md-*</code>, <code>.col-lg-*</code>, <code>.col-xl-*</code>

- Progressive Enhancement:** Start with basic layout, add complexity for larger screens
- Content Priority:** Ensure important content is visible on all screen sizes
- Touch Optimization:** Layouts are optimized for touch interaction on mobile

Breakpoint Reference

- Extra Small (xs):** 0px and up (default, no prefix)
- Small (sm):** 576px and up
- Medium (md):** 768px and up
- Large (lg):** 992px and up
- Extra Large (xl):** 1200px and up

```
import { Component } from "@angular/core";
```

```
@Component({
  selector: "app-grid-responsive",
  standalone: true,
  template: `
    <div class="grid-responsive-demo">
      <h3>Responsive Grid Layout</h3>

      <div class="demo-section">
        <h4>Responsive Column Classes</h4>
        <p>
          Grid columns that adapt to different screen sizes using
          breakpoint-specific classes.
        </p>

        <div class="container">
          <div class="row">
            <div class="col-12 col-sm-6 col-md-4 col-lg-3">
              <div class="grid-item responsive">
                <h5>Responsive Column</h5>
                <p>
                  <strong>Mobile:</strong> 12/12 (100%)<br />
                  <strong>Small:</strong> 6/12 (50%)<br />
                  <strong>Medium:</strong> 4/12 (33.33%)<br />
                  <strong>Large:</strong> 3/12 (25%)
                </p>
              </div>
            </div>
          </div>
        </div>
      </div>
    </div>
  `
})
```

```

    </div>
    <div class="col-12 col-sm-6 col-md-4 col-lg-3">
      <div class="grid-item responsive">
        <h5>Responsive Column</h5>
        <p>
          <strong>Mobile:</strong> 12/12 (100%)<br />
          <strong>Small:</strong> 6/12 (50%)<br />
          <strong>Medium:</strong> 4/12 (33.33%)<br />
          <strong>Large:</strong> 3/12 (25%)
        </p>
      </div>
    </div>
    <div class="col-12 col-sm-6 col-md-4 col-lg-3">
      <div class="grid-item responsive">
        <h5>Responsive Column</h5>
        <p>
          <strong>Mobile:</strong> 12/12 (100%)<br />
          <strong>Small:</strong> 6/12 (50%)<br />
          <strong>Medium:</strong> 4/12 (33.33%)<br />
          <strong>Large:</strong> 3/12 (25%)
        </p>
      </div>
    </div>
    <div class="col-12 col-sm-6 col-md-4 col-lg-3">
      <div class="grid-item responsive">
        <h5>Responsive Column</h5>
        <p>
          <strong>Mobile:</strong> 12/12 (100%)<br />
          <strong>Small:</strong> 6/12 (50%)<br />
          <strong>Medium:</strong> 4/12 (33.33%)<br />
          <strong>Large:</strong> 3/12 (25%)
        </p>
      </div>
    </div>
  </div>
</div>
<div class="demo-section">
  <h4>Mobile-First Layout</h4>
  <p>
    Layout that starts with mobile design and progressively enhances for
    larger screens.
  </p>
  <div class="container">
    <div class="row">
      <div class="col-12 col-md-8">
        <div class="grid-item primary">
          <h5>Main Content</h5>
          <p>
            <strong>Mobile:</strong> Full width (12/12)<br />
            <strong>Medium+:</strong> 8/12 width
          </p>
          <p>

```

```

        This column takes full width on mobile devices and 8/12 width
        on medium screens and larger.
    </p>
</div>
</div>
<div class="col-12 col-md-4">
    <div class="grid-item secondary">
        <h5>Sidebar</h5>
        <p>
            <strong>Mobile:</strong> Full width (12/12)<br />
            <strong>Medium+:</strong> 4/12 width
        </p>
        <p>
            This sidebar appears below the main content on mobile and
            beside it on larger screens.
        </p>
    </div>
</div>
</div>
</div>
</div>
<div class="demo-section">
    <h4>Complex Responsive Layout</h4>
    <p>
        Advanced responsive layout with different column configurations at
        each breakpoint.
    </p>

    <div class="container">
        <div class="row">
            <div class="col-12 col-sm-6 col-lg-4">
                <div class="grid-item">
                    <h5>Feature 1</h5>
                    <p>
                        <strong>Mobile:</strong> 12/12 (100%)<br />
                        <strong>Small:</strong> 6/12 (50%)<br />
                        <strong>Large:</strong> 4/12 (33.33%)
                    </p>
                </div>
            </div>
            <div class="col-12 col-sm-6 col-lg-4">
                <div class="grid-item">
                    <h5>Feature 2</h5>
                    <p>
                        <strong>Mobile:</strong> 12/12 (100%)<br />
                        <strong>Small:</strong> 6/12 (50%)<br />
                        <strong>Large:</strong> 4/12 (33.33%)
                    </p>
                </div>
            </div>
            <div class="col-12 col-sm-12 col-lg-4">
                <div class="grid-item">
                    <h5>Feature 3</h5>
                    <p>
                        <strong>Mobile:</strong> 12/12 (100%)<br />

```

```

        <strong>Small:</strong> 12/12 (100%)<br />
        <strong>Large:</strong> 4/12 (33.33%)
    </p>
</div>
</div>
</div>
</div>
</div>
</div>

<div class="demo-section">
    <h4>Responsive Navigation</h4>
    <p>Navigation layout that adapts to different screen sizes.</p>

    <div class="container">
        <div class="row align-items-center">
            <div class="col-12 col-md-3">
                <div class="grid-item nav-brand">
                    <h5>Brand Logo</h5>
                    <p>Always full width on mobile, 3/12 on medium+</p>
                </div>
            </div>
            <div class="col-12 col-md-9">
                <div class="grid-item nav-menu">
                    <h5>Navigation Menu</h5>
                    <p>Full width on mobile, 9/12 on medium+</p>
                    <div class="nav-items">
                        <span class="nav-item">Home</span>
                        <span class="nav-item">About</span>
                        <span class="nav-item">Services</span>
                        <span class="nav-item">Contact</span>
                    </div>
                </div>
            </div>
        </div>
    </div>
</div>

<div class="demo-section">
    <h4>Responsive Form Layout</h4>
    <p>
        Form fields that stack on mobile and align side-by-side on larger
        screens.
    </p>

    <div class="container">
        <div class="row">
            <div class="col-12 col-sm-6">
                <div class="grid-item form-field">
                    <h5>First Name</h5>
                    <p>Full width on mobile, 6/12 on small+</p>
                </div>
            </div>
            <div class="col-12 col-sm-6">
                <div class="grid-item form-field">
                    <h5>Last Name</h5>
                    <p>Full width on mobile, 6/12 on small+</p>
                </div>
            </div>
        </div>
    </div>
</div>

```

```

    </div>
  </div>
  <div class="col-12">
    <div class="grid-item form-field">
      <h5>Email Address</h5>
      <p>Always full width across all screen sizes</p>
    </div>
  </div>
  <div class="col-12 col-md-8">
    <div class="grid-item form-field">
      <h5>Message</h5>
      <p>Full width on mobile, 8/12 on medium+</p>
    </div>
  </div>
  <div class="col-12 col-md-4">
    <div class="grid-item form-field">
      <h5>Submit</h5>
      <p>Full width on mobile, 4/12 on medium+</p>
    </div>
  </div>
</div>
</div>
</div>
</div>

<div class="demo-info">
  <h4>Responsive Grid Features</h4>
  <ul>
    <li>
      <strong>Mobile-First:</strong> Design for mobile devices first, then
      enhance for larger screens
    </li>
    <li>
      <strong>Breakpoint Classes:</strong> Use <code>.col-sm-*</code>,
      <code>.col-md-*</code>, <code>.col-lg-*</code>,
      <code>.col-xl-*</code>
    </li>
    <li>
      <strong>Progressive Enhancement:</strong> Start with basic layout,
      add complexity for larger screens
    </li>
    <li>
      <strong>Content Priority:</strong> Ensure important content is
      visible on all screen sizes
    </li>
    <li>
      <strong>Touch Optimization:</strong> Layouts are optimized for touch
      interaction on mobile
    </li>
  </ul>

  <h4>Breakpoint Reference</h4>
  <ul>
    <li>
      <strong>Extra Small (xs):</strong> 0px and up (default, no prefix)
    </li>
    <li><strong>Small (sm):</strong> 576px and up</li>
  </ul>

```

```

        <li><strong>Medium (md):</strong> 768px and up</li>
        <li><strong>Large (lg):</strong> 992px and up</li>
        <li><strong>Extra Large (xl):</strong> 1200px and up</li>
    </ul>
</div>
</div>
,
styles: [
,
    .grid-responsive-demo {
        padding: 20px;
        max-width: 1200px;
        margin: 0 auto;
    }

    .grid-responsive-demo h3 {
        margin: 0 0 20px 0;
        color: #333;
        font-size: 24px;
        font-weight: 600;
    }

    .demo-section {
        margin-bottom: 40px;
        padding: 20px;
        border: 1px solid #e5e7eb;
        border-radius: 8px;
        background: #f9fafb;
    }

    .demo-section h4 {
        margin: 0 0 12px 0;
        color: #333;
        font-size: 18px;
        font-weight: 600;
    }

    .demo-section p {
        margin: 0 0 20px 0;
        color: #555;
        line-height: 1.5;
    }

    .demo-section code {
        background: #f1f3f4;
        padding: 2px 6px;
        border-radius: 4px;
        font-family: monospace;
        font-size: 14px;
    }

    .grid-item {
        background: #fff;
        border: 1px solid #e5e7eb;
        border-radius: 6px;
        padding: 20px;

```

```
    height: 100%;
    min-height: 120px;
    display: flex;
    flex-direction: column;
    justify-content: center;
}

.grid-item h5 {
    margin: 0 0 12px 0;
    color: #333;
    font-size: 16px;
    font-weight: 600;
}

.grid-item p {
    margin: 0;
    color: #666;
    line-height: 1.4;
}

.grid-item.responsive {
    background: #fff3cd;
    border-color: #ffc107;
}

.grid-item.primary {
    background: #e3f2fd;
    border-color: #2196f3;
}

.grid-item.secondary {
    background: #f3e5f5;
    border-color: #9c27b0;
}

.grid-item.nav-brand {
    background: #e8f5e8;
    border-color: #4caf50;
    min-height: 80px;
}

.grid-item.nav-menu {
    background: #fff8e1;
    border-color: #ff9800;
    min-height: 80px;
}

.nav-items {
    display: flex;
    gap: 15px;
    margin-top: 10px;
}

.nav-item {
    background: #ff9800;
    color: white;
```

```

        padding: 5px 10px;
        border-radius: 4px;
        font-size: 14px;
    }

    .grid-item.form-field {
        background: #f8f9fa;
        border-color: #6c757d;
        min-height: 100px;
    }

    .demo-info {
        margin-top: 40px;
        padding: 20px;
        background: #f8f9fa;
        border: 1px solid #dee2e6;
        border-radius: 8px;
    }

    .demo-info h4 {
        margin: 0 0 16px 0;
        color: #333;
        font-size: 18px;
        font-weight: 600;
    }

    .demo-info ul {
        margin: 0 0 20px 0;
        padding-left: 20px;
        color: #555;
    }

    .demo-info li {
        margin-bottom: 8px;
        line-height: 1.4;
    }

    .demo-info strong {
        color: #333;
    }
},
],
}))
export class GridResponsiveComponent {
    constructor() {
        console.log("Grid Responsive Component initialized");
    }
}

```



```

<div class="grid-flexbox-demo">
  <h3>Flexbox Utilities</h3>

  <div class="demo-section">
    <h4>Flex Direction</h4>
    <p>Control the direction of flex items using direction classes.</p>

    <div class="container">
      <div class="row">
        <div class="col-6">
          <div class="grid-item">
            <h5>Row Direction (Default)</h5>
            <p>Items flow horizontally from left to right.</p>
            <div class="flex-demo flex-row">
              <div class="flex-item">1</div>
              <div class="flex-item">2</div>
              <div class="flex-item">3</div>
            </div>
          </div>
        </div>
        <div class="col-6">
          <div class="grid-item">
            <h5>Column Direction</h5>
            <p>Items flow vertically from top to bottom.</p>
            <div class="flex-demo flex-column">
              <div class="flex-item">1</div>
              <div class="flex-item">2</div>
              <div class="flex-item">3</div>
            </div>
          </div>
        </div>
      </div>

      <div class="row">
        <div class="col-6">
          <div class="grid-item">
            <h5>Row Reverse</h5>
            <p>Items flow horizontally from right to left.</p>
            <div class="flex-demo flex-row-reverse">
              <div class="flex-item">1</div>
              <div class="flex-item">2</div>
              <div class="flex-item">3</div>
            </div>
          </div>
        </div>
        <div class="col-6">
          <div class="grid-item">
            <h5>Column Reverse</h5>
            <p>Items flow vertically from bottom to top.</p>
            <div class="flex-demo flex-column-reverse">
              <div class="flex-item">1</div>
              <div class="flex-item">2</div>
              <div class="flex-item">3</div>
            </div>
          </div>
        </div>
      </div>
    </div>
  </div>

```

```

    </div>
  </div>
</div>

<div class="demo-section">
  <h4>Flex Wrap</h4>
  <p>Control how flex items wrap when they exceed the container width.</p>

  <div class="container">
    <div class="row">
      <div class="col-6">
        <div class="grid-item">
          <h5>Wrap (Default)</h5>
          <p>Items wrap to the next line when needed.</p>
          <div class="flex-demo flex-wrap">
            <div class="flex-item wide">Item 1</div>
            <div class="flex-item wide">Item 2</div>
            <div class="flex-item wide">Item 3</div>
            <div class="flex-item wide">Item 4</div>
          </div>
        </div>
      </div>
      <div class="col-6">
        <div class="grid-item">
          <h5>No Wrap</h5>
          <p>Items stay on a single line and may overflow.</p>
          <div class="flex-demo flex-nowrap">
            <div class="flex-item wide">Item 1</div>
            <div class="flex-item wide">Item 2</div>
            <div class="flex-item wide">Item 3</div>
            <div class="flex-item wide">Item 4</div>
          </div>
        </div>
      </div>
    </div>
  </div>

  <div class="row">
    <div class="col-12">
      <div class="grid-item">
        <h5>Wrap Reverse</h5>
        <p>Items wrap to the previous line in reverse order.</p>
        <div class="flex-demo flex-wrap-reverse">
          <div class="flex-item wide">Item 1</div>
          <div class="flex-item wide">Item 2</div>
          <div class="flex-item wide">Item 3</div>
          <div class="flex-item wide">Item 4</div>
          <div class="flex-item wide">Item 5</div>
          <div class="flex-item wide">Item 6</div>
        </div>
      </div>
    </div>
  </div>
</div>

<div class="demo-section">

```

<h4>Justify Content</h4>

<p>Control the alignment of flex items along the main axis.</p>

```
<div class="container">
  <div class="row">
    <div class="col-4">
      <div class="grid-item">
        <h5>Start (Default)</h5>
        <p>Items align to the start of the container.</p>
        <div class="flex-demo justify-content-start">
          <div class="flex-item">1</div>
          <div class="flex-item">2</div>
          <div class="flex-item">3</div>
        </div>
      </div>
    </div>
    <div class="col-4">
      <div class="grid-item">
        <h5>Center</h5>
        <p>Items align to the center of the container.</p>
        <div class="flex-demo justify-content-center">
          <div class="flex-item">1</div>
          <div class="flex-item">2</div>
          <div class="flex-item">3</div>
        </div>
      </div>
    </div>
    <div class="col-4">
      <div class="grid-item">
        <h5>End</h5>
        <p>Items align to the end of the container.</p>
        <div class="flex-demo justify-content-end">
          <div class="flex-item">1</div>
          <div class="flex-item">2</div>
          <div class="flex-item">3</div>
        </div>
      </div>
    </div>
  </div>

  <div class="row">
    <div class="col-6">
      <div class="grid-item">
        <h5>Between</h5>
        <p>Items are distributed with space between them.</p>
        <div class="flex-demo justify-content-between">
          <div class="flex-item">1</div>
          <div class="flex-item">2</div>
          <div class="flex-item">3</div>
        </div>
      </div>
    </div>
    <div class="col-6">
      <div class="grid-item">
        <h5>Around</h5>
        <p>Items are distributed with equal space around them.</p>
```

```

        <div class="flex-demo justify-content-around">
            <div class="flex-item">1</div>
            <div class="flex-item">2</div>
            <div class="flex-item">3</div>
        </div>
    </div>
</div>
</div>
</div>
</div>
</div>

<div class="demo-section">
    <h4>Align Items</h4>
    <p>Control the alignment of flex items along the cross axis.</p>

    <div class="container">
        <div class="row">
            <div class="col-4">
                <div class="grid-item">
                    <h5>Start</h5>
                    <p>Items align to the start of the cross axis.</p>
                    <div class="flex-demo align-items-start">
                        <div class="flex-item tall">1</div>
                        <div class="flex-item">2</div>
                        <div class="flex-item tall">3</div>
                    </div>
                </div>
            </div>
            <div class="col-4">
                <div class="grid-item">
                    <h5>Center</h5>
                    <p>Items align to the center of the cross axis.</p>
                    <div class="flex-demo align-items-center">
                        <div class="flex-item tall">1</div>
                        <div class="flex-item">2</div>
                        <div class="flex-item tall">3</div>
                    </div>
                </div>
            </div>
            <div class="col-4">
                <div class="grid-item">
                    <h5>End</h5>
                    <p>Items align to the end of the cross axis.</p>
                    <div class="flex-demo align-items-end">
                        <div class="flex-item tall">1</div>
                        <div class="flex-item">2</div>
                        <div class="flex-item tall">3</div>
                    </div>
                </div>
            </div>
        </div>
    </div>

    <div class="row">
        <div class="col-6">
            <div class="grid-item">
                <h5>Baseline</h5>

```

```

        <p>Items align to their baseline.</p>
        <div class="flex-demo align-items-baseline">
            <div class="flex-item baseline">1</div>
            <div class="flex-item">2</div>
            <div class="flex-item baseline">3</div>
        </div>
    </div>
</div>
<div class="col-6">
    <div class="grid-item">
        <h5>Stretch (Default)</h5>
        <p>Items stretch to fill the container height.</p>
        <div class="flex-demo align-items-stretch">
            <div class="flex-item">1</div>
            <div class="flex-item">2</div>
            <div class="flex-item">3</div>
        </div>
    </div>
</div>
</div>
</div>
</div>
</div>

<div class="demo-section">
    <h4>Align Self</h4>
    <p>Override the alignment for individual flex items.</p>

    <div class="container">
        <div class="row">
            <div class="col-12">
                <div class="grid-item">
                    <h5>Individual Item Alignment</h5>
                    <p>Each item can have its own alignment override.</p>
                    <div class="flex-demo">
                        <div class="flex-item tall align-self-start">Start</div>
                        <div class="flex-item align-self-center">Center</div>
                        <div class="flex-item tall align-self-end">End</div>
                        <div class="flex-item align-self-baseline">Baseline</div>
                        <div class="flex-item align-self-stretch">Stretch</div>
                    </div>
                </div>
            </div>
        </div>
    </div>
</div>

<div class="demo-section">
    <h4>Responsive Flexbox</h4>
    <p>Flexbox utilities with responsive breakpoint variants.</p>

    <div class="container">
        <div class="row">
            <div class="col-12">
                <div class="grid-item">
                    <h5>Responsive Flex Direction</h5>
                    <p>

```

```

        Direction changes based on screen size: column on mobile, row on
        larger screens.
    </p>
    <div class="flex-demo flex-column flex-md-row">
        <div class="flex-item">Mobile: Column</div>
        <div class="flex-item">Desktop: Row</div>
        <div class="flex-item">Responsive!</div>
    </div>
</div>
</div>
</div>

<div class="row">
    <div class="col-12">
        <div class="grid-item">
            <h5>Responsive Justify Content</h5>
            <p>
                Alignment changes based on screen size: center on mobile, between
                on larger screens.
            </p>
            <div
                class="flex-demo justify-content-center justify-content-md-between"
            >
                <div class="flex-item">Centered on mobile</div>
                <div class="flex-item">Between on desktop</div>
                <div class="flex-item">Responsive alignment!</div>
            </div>
        </div>
    </div>
</div>
</div>
</div>

<div class="demo-info">
    <h4>Flexbox Utility Features</h4>
    <ul>
        <li>
            <strong>Direction Control:</strong> Row, column, and reverse variants
        </li>
        <li><strong>Wrap Options:</strong> Wrap, nowrap, and wrap-reverse</li>
        <li>
            <strong>Justify Content:</strong> Start, end, center, between, around
        </li>
        <li>
            <strong>Align Items:</strong> Start, end, center, baseline, stretch
        </li>
        <li><strong>Align Self:</strong> Individual item alignment override</li>
        <li>
            <strong>Responsive Variants:</strong> All utilities available at each
            breakpoint
        </li>
    </ul>

    <h4>Common Use Cases</h4>
    <ul>
        <li>

```

```

        <strong>Navigation:</strong> Use justify-content-between for logo and
        menu
    </li>
    <li>
        <strong>Centered Content:</strong> Use justify-content-center and
        align-items-center
    </li>
    <li>
        <strong>Card Layouts:</strong> Use flex-wrap for responsive card grids
    </li>
    <li>
        <strong>Form Layouts:</strong> Use flex-column for stacked form fields
    </li>
    <li>
        <strong>Responsive Design:</strong> Combine with breakpoint classes for
        adaptive layouts
    </li>
</ul>
</div>
</div>

```

```

import { Component } from "@angular/core";

@Component({
  selector: "app-grid-flexbox",
  standalone: true,
  template: `
    <div class="grid-flexbox-demo">
      <h3>Flexbox Utilities</h3>

      <div class="demo-section">
        <h4>Flex Direction</h4>
        <p>Control the direction of flex items using direction classes.</p>

        <div class="container">
          <div class="row">
            <div class="col-6">
              <div class="grid-item">
                <h5>Row Direction (Default)</h5>
                <p>Items flow horizontally from left to right.</p>
                <div class="flex-demo flex-row">
                  <div class="flex-item">1</div>
                  <div class="flex-item">2</div>
                  <div class="flex-item">3</div>
                </div>
              </div>
            </div>
            <div class="col-6">
              <div class="grid-item">
                <h5>Column Direction</h5>
                <p>Items flow vertically from top to bottom.</p>
                <div class="flex-demo flex-column">
                  <div class="flex-item">1</div>

```

```

        <div class="flex-item">2</div>
        <div class="flex-item">3</div>
    </div>
</div>
</div>
</div>
</div>

<div class="row">
    <div class="col-6">
        <div class="grid-item">
            <h5>Row Reverse</h5>
            <p>Items flow horizontally from right to left.</p>
            <div class="flex-demo flex-row-reverse">
                <div class="flex-item">1</div>
                <div class="flex-item">2</div>
                <div class="flex-item">3</div>
            </div>
        </div>
    </div>
</div>
<div class="col-6">
    <div class="grid-item">
        <h5>Column Reverse</h5>
        <p>Items flow vertically from bottom to top.</p>
        <div class="flex-demo flex-column-reverse">
            <div class="flex-item">1</div>
            <div class="flex-item">2</div>
            <div class="flex-item">3</div>
        </div>
    </div>
</div>
</div>
</div>
</div>

<div class="demo-section">
    <h4>Flex Wrap</h4>
    <p>Control how flex items wrap when they exceed the container width.</p>

    <div class="container">
        <div class="row">
            <div class="col-6">
                <div class="grid-item">
                    <h5>Wrap (Default)</h5>
                    <p>Items wrap to the next line when needed.</p>
                    <div class="flex-demo flex-wrap">
                        <div class="flex-item wide">Item 1</div>
                        <div class="flex-item wide">Item 2</div>
                        <div class="flex-item wide">Item 3</div>
                        <div class="flex-item wide">Item 4</div>
                    </div>
                </div>
            </div>
        </div>
        <div class="col-6">
            <div class="grid-item">
                <h5>No Wrap</h5>
                <p>Items stay on a single line and may overflow.</p>
            </div>
        </div>
    </div>

```



```

        <div class="flex-demo flex-nowrap">
            <div class="flex-item wide">Item 1</div>
            <div class="flex-item wide">Item 2</div>
            <div class="flex-item wide">Item 3</div>
            <div class="flex-item wide">Item 4</div>
        </div>
    </div>
</div>
</div>

<div class="row">
    <div class="col-12">
        <div class="grid-item">
            <h5>Wrap Reverse</h5>
            <p>Items wrap to the previous line in reverse order.</p>
            <div class="flex-demo flex-wrap-reverse">
                <div class="flex-item wide">Item 1</div>
                <div class="flex-item wide">Item 2</div>
                <div class="flex-item wide">Item 3</div>
                <div class="flex-item wide">Item 4</div>
                <div class="flex-item wide">Item 5</div>
                <div class="flex-item wide">Item 6</div>
            </div>
        </div>
    </div>
</div>
</div>
</div>

<div class="demo-section">
    <h4>Justify Content</h4>
    <p>Control the alignment of flex items along the main axis.</p>

    <div class="container">
        <div class="row">
            <div class="col-4">
                <div class="grid-item">
                    <h5>Start (Default)</h5>
                    <p>Items align to the start of the container.</p>
                    <div class="flex-demo justify-content-start">
                        <div class="flex-item">1</div>
                        <div class="flex-item">2</div>
                        <div class="flex-item">3</div>
                    </div>
                </div>
            </div>
        </div>
        <div class="col-4">
            <div class="grid-item">
                <h5>Center</h5>
                <p>Items align to the center of the container.</p>
                <div class="flex-demo justify-content-center">
                    <div class="flex-item">1</div>
                    <div class="flex-item">2</div>
                    <div class="flex-item">3</div>
                </div>
            </div>
        </div>
    </div>

```

```

    </div>
    <div class="col-4">
      <div class="grid-item">
        <h5>End</h5>
        <p>Items align to the end of the container.</p>
        <div class="flex-demo justify-content-end">
          <div class="flex-item">1</div>
          <div class="flex-item">2</div>
          <div class="flex-item">3</div>
        </div>
      </div>
    </div>
  </div>
</div>

<div class="row">
  <div class="col-6">
    <div class="grid-item">
      <h5>Between</h5>
      <p>Items are distributed with space between them.</p>
      <div class="flex-demo justify-content-between">
        <div class="flex-item">1</div>
        <div class="flex-item">2</div>
        <div class="flex-item">3</div>
      </div>
    </div>
  </div>
  <div class="col-6">
    <div class="grid-item">
      <h5>Around</h5>
      <p>Items are distributed with equal space around them.</p>
      <div class="flex-demo justify-content-around">
        <div class="flex-item">1</div>
        <div class="flex-item">2</div>
        <div class="flex-item">3</div>
      </div>
    </div>
  </div>
</div>
</div>

<div class="demo-section">
  <h4>Align Items</h4>
  <p>Control the alignment of flex items along the cross axis.</p>

  <div class="container">
    <div class="row">
      <div class="col-4">
        <div class="grid-item">
          <h5>Start</h5>
          <p>Items align to the start of the cross axis.</p>
          <div class="flex-demo align-items-start">
            <div class="flex-item tall">1</div>
            <div class="flex-item">2</div>
            <div class="flex-item tall">3</div>
          </div>
        </div>
      </div>
    </div>
  </div>

```

```

    </div>
  </div>
  <div class="col-4">
    <div class="grid-item">
      <h5>Center</h5>
      <p>Items align to the center of the cross axis.</p>
      <div class="flex-demo align-items-center">
        <div class="flex-item tall">1</div>
        <div class="flex-item">2</div>
        <div class="flex-item tall">3</div>
      </div>
    </div>
  </div>
  <div class="col-4">
    <div class="grid-item">
      <h5>End</h5>
      <p>Items align to the end of the cross axis.</p>
      <div class="flex-demo align-items-end">
        <div class="flex-item tall">1</div>
        <div class="flex-item">2</div>
        <div class="flex-item tall">3</div>
      </div>
    </div>
  </div>
</div>

<div class="row">
  <div class="col-6">
    <div class="grid-item">
      <h5>Baseline</h5>
      <p>Items align to their baseline.</p>
      <div class="flex-demo align-items-baseline">
        <div class="flex-item baseline">1</div>
        <div class="flex-item">2</div>
        <div class="flex-item baseline">3</div>
      </div>
    </div>
  </div>
  <div class="col-6">
    <div class="grid-item">
      <h5>Stretch (Default)</h5>
      <p>Items stretch to fill the container height.</p>
      <div class="flex-demo align-items-stretch">
        <div class="flex-item">1</div>
        <div class="flex-item">2</div>
        <div class="flex-item">3</div>
      </div>
    </div>
  </div>
</div>
</div>

<div class="demo-section">
  <h4>Align Self</h4>
  <p>Override the alignment for individual flex items.</p>

```

```

<div class="container">
  <div class="row">
    <div class="col-12">
      <div class="grid-item">
        <h5>Individual Item Alignment</h5>
        <p>Each item can have its own alignment override.</p>
        <div class="flex-demo">
          <div class="flex-item tall align-self-start">Start</div>
          <div class="flex-item align-self-center">Center</div>
          <div class="flex-item tall align-self-end">End</div>
          <div class="flex-item align-self-baseline">Baseline</div>
          <div class="flex-item align-self-stretch">Stretch</div>
        </div>
      </div>
    </div>
  </div>
</div>
</div>

<div class="demo-section">
  <h4>Responsive Flexbox</h4>
  <p>Flexbox utilities with responsive breakpoint variants.</p>

  <div class="container">
    <div class="row">
      <div class="col-12">
        <div class="grid-item">
          <h5>Responsive Flex Direction</h5>
          <p>
            Direction changes based on screen size: column on mobile, row
            on larger screens.
          </p>
          <div class="flex-demo flex-column flex-md-row">
            <div class="flex-item">Mobile: Column</div>
            <div class="flex-item">Desktop: Row</div>
            <div class="flex-item">Responsive!</div>
          </div>
        </div>
      </div>
    </div>
  </div>

  <div class="row">
    <div class="col-12">
      <div class="grid-item">
        <h5>Responsive Justify Content</h5>
        <p>
          Alignment changes based on screen size: center on mobile,
          between on larger screens.
        </p>
        <div
          class="flex-demo justify-content-center justify-content-md-between"
        >
          <div class="flex-item">Centered on mobile</div>
          <div class="flex-item">Between on desktop</div>
          <div class="flex-item">Responsive alignment!</div>
        </div>
      </div>
    </div>
  </div>

```

```
    </div>
  </div>
</div>
</div>
</div>
```

```
<div class="demo-info">
```

```
  <h4>Flexbox Utility Features</h4>
```

```
  <ul>
```

```
    <li>
```

```
      <strong>Direction Control:</strong> Row, column, and reverse  
      variants
```

```
    </li>
```

```
    <li><strong>Wrap Options:</strong> Wrap, nowrap, and wrap-reverse</li>
```

```
    <li>
```

```
      <strong>Justify Content:</strong> Start, end, center, between,  
      around
```

```
    </li>
```

```
    <li>
```

```
      <strong>Align Items:</strong> Start, end, center, baseline, stretch
```

```
    </li>
```

```
    <li>
```

```
      <strong>Align Self:</strong> Individual item alignment override
```

```
    </li>
```

```
    <li>
```

```
      <strong>Responsive Variants:</strong> All utilities available at  
      each breakpoint
```

```
    </li>
```

```
  </ul>
```

```
  <h4>Common Use Cases</h4>
```

```
  <ul>
```

```
    <li>
```

```
      <strong>Navigation:</strong> Use justify-content-between for logo  
      and menu
```

```
    </li>
```

```
    <li>
```

```
      <strong>Centered Content:</strong> Use justify-content-center and  
      align-items-center
```

```
    </li>
```

```
    <li>
```

```
      <strong>Card Layouts:</strong> Use flex-wrap for responsive card  
      grids
```

```
    </li>
```

```
    <li>
```

```
      <strong>Form Layouts:</strong> Use flex-column for stacked form  
      fields
```

```
    </li>
```

```
    <li>
```

```
      <strong>Responsive Design:</strong> Combine with breakpoint classes  
      for adaptive layouts
```

```
    </li>
```

```
  </ul>
```

```
</div>
```

```
</div>
```

```
,
```

```
styles: [
  \
    .grid-flexbox-demo {
      padding: 20px;
      max-width: 1200px;
      margin: 0 auto;
    }

    .grid-flexbox-demo h3 {
      margin: 0 0 20px 0;
      color: #333;
      font-size: 24px;
      font-weight: 600;
    }

    .demo-section {
      margin-bottom: 40px;
      padding: 20px;
      border: 1px solid #e5e7eb;
      border-radius: 8px;
      background: #f9fafb;
    }

    .demo-section h4 {
      margin: 0 0 12px 0;
      color: #333;
      font-size: 18px;
      font-weight: 600;
    }

    .demo-section p {
      margin: 0 0 20px 0;
      color: #555;
      line-height: 1.5;
    }

    .grid-item {
      background: #fff;
      border: 1px solid #e5e7eb;
      border-radius: 6px;
      padding: 20px;
      height: 100%;
      min-height: 150px;
      display: flex;
      flex-direction: column;
    }

    .grid-item h5 {
      margin: 0 0 12px 0;
      color: #333;
      font-size: 16px;
      font-weight: 600;
    }

    .grid-item p {
      margin: 0 0 15px 0;
```

```
    color: #666;
    line-height: 1.4;
}

.flex-demo {
  display: flex;
  background: #f8f9fa;
  border: 1px solid #dee2e6;
  border-radius: 4px;
  padding: 10px;
  min-height: 60px;
  gap: 10px;
}

.flex-item {
  background: #007bff;
  color: white;
  padding: 10px 15px;
  border-radius: 4px;
  display: flex;
  align-items: center;
  justify-content: center;
  font-weight: 600;
  min-width: 40px;
  min-height: 40px;
}

.flex-item.wide {
  min-width: 80px;
}

.flex-item.tall {
  min-height: 60px;
}

.flex-item.baseline {
  font-size: 18px;
  padding-top: 20px;
}

.demo-info {
  margin-top: 40px;
  padding: 20px;
  background: #f8f9fa;
  border: 1px solid #dee2e6;
  border-radius: 8px;
}

.demo-info h4 {
  margin: 0 0 16px 0;
  color: #333;
  font-size: 18px;
  font-weight: 600;
}

.demo-info ul {
```

```

        margin: 0 0 20px 0;
        padding-left: 20px;
        color: #555;
    }

    .demo-info li {
        margin-bottom: 8px;
        line-height: 1.4;
    }

    .demo-info strong {
        color: #333;
    }
},
],
})
export class GridFlexboxComponent {
    constructor() {
        console.log("Grid Flexbox Component initialized");
    }
}

```

■ No code found

■ No code found